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Social capability and economic development

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SOCIAL CAPABILITY AND ECONOMIC GROWTH*

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The conventional wisdom is that postwar economic growth has been unpredictable. In the 1960s few observers accurately forecast which countries would grow quickly. In this paper we show that indexes of social development constructed in the early 1960s have considerable predictive power. These results indicate the importance of "social capability" for economic growth. We emphasize that social arrangements matter for reasons beyond those discussed in recent work on trust and social capital. However, we are also able to show that one of the indexes may be a useful proxy for social capital in developing countries.

I. INTRODUCTION

The conventional wisdom is that long-run rates of economic growth are not easily predicted. In the 1960s a variety of observers failed to predict either the East Asian miracle or the relative failure of sub-Saharan Africa. Prominent researchers and World Bank teams thought that Korea's development targets were unrealistic, and that Burma, Sri Lanka, and the Philippines would do well. Asia's prospects were widely thought to be bettered by Africa's. In 1967 the World Bank's chief economist listed seven African countries that "clearly have the potential to reach or surpass a seven percent rate of growth." All of those cited had negative per capita growth rates over 1970–1988.[1]

In this paper we argue that so many predictions went awry because researchers sought the origins of long-run growth in the wrong places. In particular, they neglected the role of "social capability" in economic development. We show that an index of socioeconomic development, constructed in the early 1960s by the development economists Irma Adelman and Cynthia Taft Morris, could have helped researchers make much better forecasts of long-run growth rates.

This finding is particularly interesting in that the variable is not based on ex post observation. Unlike some attempts to quantify the effect of social factors, one cannot simply attribute the results to the bias of observers who already know about the postwar growth experience. In turn, the finding suggests that

* This research greatly benefited from discussions with Stephen Bond, John Muellbauer, and Stephen Nickell, and from the comments of Olivier Blanchard, Stephen Redding, and three anonymous referees. Any mistakes are ours.

1. See Easterly [1995] for references and further examples.

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contemporary economists, in seeking to explain growth variation, should think about some of the issues that interest sociologists, and that interested the economists of previous decades.

By going back to the raw data compiled by Adelman and Morris (hereinafter AM), we are also able to investigate which components of the index are most important to growth. Several of the components are correlated with growth, mainly because they help explain factor accumulation. One indicator in particular, the extent of mass communications, appears to have a direct effect on TFP growth as well. This effect is robust to the inclusion of a variety of other variables, including ones reflecting health, urbanization, and income distribution. Overall, we think we have amassed some interesting evidence that fast growth is partly the outcome of favorable social arrangements.

The plan of the paper is as follows. The next section briefly discusses earlier work on society and growth, including reasons why social arrangements might matter. Section III describes the construction of the index, and demonstrates that researchers in the 1960s might have found it a useful predictor of growth. In Section IV we try to overcome some common objections to the AM index by examining the growth role of its more "social" components. Section V presents the results of some simple robustness tests. Section VI considers the relation of this paper to other recent work on social variables, particularly indicators of trust. Finally, Section VII concludes.

II. Society and Growth

The idea that society matters for growth is almost as old as economics itself. Cole, Mailath, and Postlewaite [1992] write that "the interaction between the organization of a society and its economic performance was once considered perhaps the fundamental question of political economy" [p. 1095]. Modern social arrangements have sometimes been placed among the preconditions for economic development, as in United Nations [1951] and the first mission reports of the World Bank [Spengler 1954].

Abramovitz [1986] has been particularly influential in emphasizing the growth role of "social capability." Abramovitz and David [1996] see social capability as embracing the attributes and qualities of people and organizations that influence the responses of people to economic opportunity, yet originate in social and political institutions. However, few papers have made much

progress in identifying such effects on economic development. The problem with social capability has been, as Abramovitz [1986] points out, that "no one knows just what it means or how to measure it."

In the past few years the concept of "social capital" has come to the fore, with the much publicized work of Putnam [1993]. Writers on social capital have tended to emphasize indicators of trust and social participation in their empirical work. Extending these indicators to a wide range of countries is a difficult task. In any case, it may be that the search for social influences on growth should cast its net rather wider. We consider the relation of work on trust to our own research in more detail in Section VI. For now, we simply want to emphasize that the links between society and development are potentially wide-ranging.

Why might society matter? Recent theoretical work has emphasized the interaction between social arrangements and the incentive structure. Fershtman, Murphy, and Weiss [1996] investigate the links between social status, the allocation of talent across occupations, and growth. Galor and Tsiddon [1997] present an explicit theoretical model in which social impediments to earnings mobility will distort the allocation of talent, lower the frequency of innovations, and reduce growth.

The importance of society goes beyond the extent of social mobility and the allocation of talent. Often, researchers have argued that conservative attitudes can hold back modern development. For instance, "modernization theorists" argued that the traditional extended kin group, a common feature of developing countries, might be a particular obstacle to economic growth. Some of their ideas have been criticized, but their work indicates the broad range of mechanisms that might be relevant. The data compiled by AM reflect this range, and we now turn to the construction of their index.

III. The Adelman-Morris Index

This paper takes as its starting point an ambitious project carried out in the 1960s by the development economists Adelman and Morris, and documented in AM [1967]. Their aim was to study the interaction of economic and noneconomic forces in the course of development. First, we examine the construction of their social development index, and then we turn to its empirical usefulness.

1. The Construction of the Index

AM began with data on 41 social, political, and economic indicators for 74 developing countries, generally for the period 1957–1962. Some of the indicators were based on published statistics; others necessarily combined data with informal assessments, including information from about 30 country and regional experts, using written answers and interviews. One goal of the study was to understand the interaction between political and social arrangements and economic growth, and so for part of their analysis AM restricted their attention to data on 1961 per capita GNP and the 24 indicators deemed not to be purely economic.

They used factor analysis on this data set to construct a measure of socioeconomic development. The technique is a method of data reduction, and attempts to describe the indicators as linear combinations of a small set of underlying latent variables.[2] The first factor in their analysis, that accounting for more variation in the data than any other, was interpreted as reflecting socioeconomic development, a reasonable judgment given the indicators with which it was most strongly associated.

To obtain their final results, AM eventually decided to omit two of the 24 indicators: the degree of cultural and ethnic homogeneity, and the extent of national integration. Their justification is that inclusion of these indicators led to country rankings that were inappropriate [AM, 1967, pp. 168–169].[3] The final index is given in Table IV-5 of AM [1967], and for brevity we refer to it as SOCDEV.

Using the raw data published in AM [1967], we have been able to replicate their factor analysis. The first factor in our own analysis has a correlation with SOCDEV of 0.993. Further investigation suggested that the index is robust to two changes: the omission of 1961 per capita income, and the inclusion of the two indicators that AM omitted. When these changes are made, the two new indexes have correlations with SOCDEV of 0.994 and 0.981, respectively. The strength of these correlations indicates that nothing substantial turns on these choices of AM.

2. For further discussion see Adelman and Morris [1968], Rayner [1970], Brookins [1970], Tekiner [1981], and Bumb [1982]. For more on factor analysis see, for instance, Harman [1976] or Everitt [1984].

3. AM argue that inclusion of these two indicators results in the index being too high for some Middle Eastern countries and too low for some Latin American countries. Hence the final index combines factor analysis with a subjective assessment.

TABLE I
THE ADELMAN-MORRIS INDEX (SOCDEV)

Group 1		Group 2		Group 3	
Niger	−1.86	Myanmar	−0.41	Colombia	0.66
Chad	−1.70	Indonesia	−0.40	Peru	0.68
Malawi	−1.57	Bolivia	−0.35	El Salvador	0.71
Benin	−1.54	India	−0.28	Egypt	0.73
Guinea	−1.47	Tunisia	−0.18	Mexico	0.75
Sierra Leone	−1.39	Pakistan	−0.08	Costa Rica	0.78
Nepal	−1.36	Iraq	−0.03	Brazil	0.79
Somalia	−1.35	Ghana	−0.01	Dominican Rep.	0.81
Yemen	−1.35	Iran	0.09	Panama	0.84
Cameroon	−1.34	Zimbabwe	0.14	Korea	0.85
Madagascar	−1.31	Jordan	0.16	Nicaragua	0.88
Tanzania	−1.22	Algeria	0.18	Turkey	0.88
Uganda	−1.22	Honduras	0.26	Paraguay	0.97
Laos	−1.06	Guatemala	0.35	Taiwan	1.05
Afghanistan	−1.02	Sri Lanka	0.35	Jamaica	1.06
Liberia	−1.01	Thailand	0.50	Cyprus	1.08
Ethiopia	−0.99	Ecuador	0.54	Trinidad	1.15
Ivory Coast	−0.98	Surinam	0.54	Venezuela	1.37
Nigeria	−0.91	Philippines	0.56	Chile	1.39
Zambia	−0.89	Syria	0.57	Lebanon	1.44
Gabon	−0.83	South Africa	0.62	Greece	1.47
Libya	−0.68			Uruguay	1.59
Sudan	−0.64			Japan	1.63
Morocco	−0.57			Israel	1.77
Cambodia	−0.55			Argentina	1.91
Kenya	−0.53				
Senegal	−0.52				
South Vietnam	−0.49				

Benin was called Dahomey at the time of the AM study. Their figure for "UAR" corresponds to Egypt, not the unification of Egypt and Syria between 1958–1961. The figure we report for Tanzania is the AM index for Tanganyika, which merged with Zanzibar in 1964 to become the modern Tanzania.

2. Assessing the Usefulness of the Index

For convenience, we list the values of SOCDEV in Table I. We order countries by the value of SOCDEV (least developed first) and divide countries into the three groups identified by AM. They describe the three groups in these terms [1967, p. 169]:

> . . . the group of countries with the lowest factor scores consists of societies that are primarily tribal and that are characterized by a preponderant nonmarket sector. The intermediate group is made up of countries in which the typical kinship structure is the extended family and in which the exchange sector of the economy is generally much larger than it is in the lowest group. The highest group includes only countries that, although still

underdeveloped in the late 1950s, are relatively advanced with respect to both social and economic development.

There are some interesting conclusions to be drawn from Table I. One of the first points to note is that the group 1 countries, ranked the lowest in terms of socioeconomic development, are predominantly drawn from sub-Saharan Africa. The table also indicates that Japan, South Korea, and Taiwan were ranked highly by the index. Another Asian success story, Thailand, is ranked toward the top end of group 2. The respective growth experiences of these countries since the early 1960s suggests that the AM index might well have some explanatory power.

In Figure I, SOCDEV is plotted against the log of 1960 per capita income. The close relation between social development and per capita income, noted in AM [1965, 1967] and replicated here using the Summers-Heston data set, is an interesting result in itself.[4] Clearly, the direction of causality is uncertain, and there are presumably links running in both directions. A higher level of social development is likely to be reflected in higher investment and lower population growth, raising steady state income, while economic development is often felt to bring far-reaching social changes in its wake.

In Figure II we plot growth between 1960 and 1985 against the level of social development. However, rather than simply use SOCDEV, we use the component of it that is orthogonal to initial per capita income. This is because, although growth may be positively related to social development, it is generally thought to be negatively related to initial income. To avoid this problem, we regress SOCDEV on the log of initial income, and take the residuals to be the orthogonal component.

It is clear from Figure II that there is a strong correlation between long-run growth and social development relative to initial income. The simple correlation coefficient is 0.60, and the Spearman's rank correlation is 0.54. This in itself suggests that SOCDEV is useful in explaining growth variation.

We can also demonstrate this using regressions.[5] The core data set and sample is that of Mankiw, Romer, and Weil [1992] (hereinafter MRW). The dependent variable is the log difference in

4. Adelman and Morris [1967] showed that 70 percent of the variation in per capita incomes can be explained using their four factors.

5. Strictly speaking, we should estimate the regressions and the factor analysis model jointly, to overcome the "generated regressor" problem. For transparency we instead use OLS, but this does mean that the standard errors reported here may slightly understate the true degree of uncertainty.

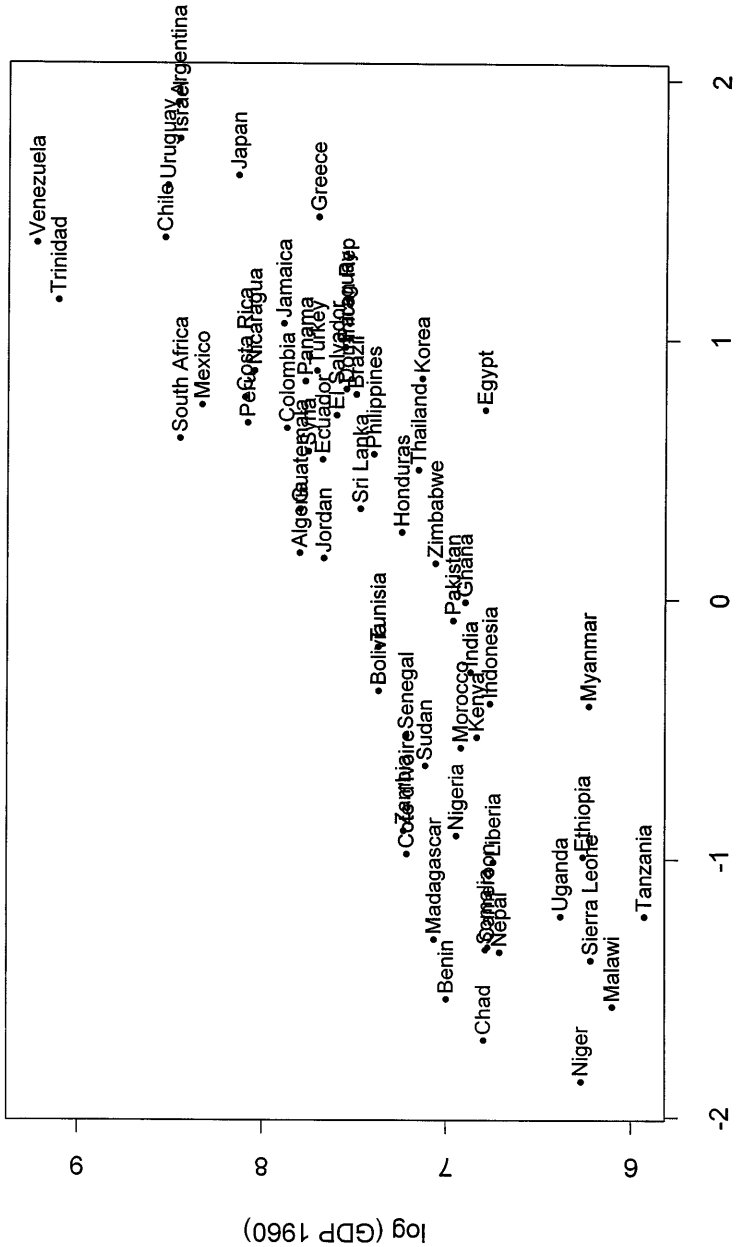

FIGURE I
The Adelman-Morris Index and per Capita Income

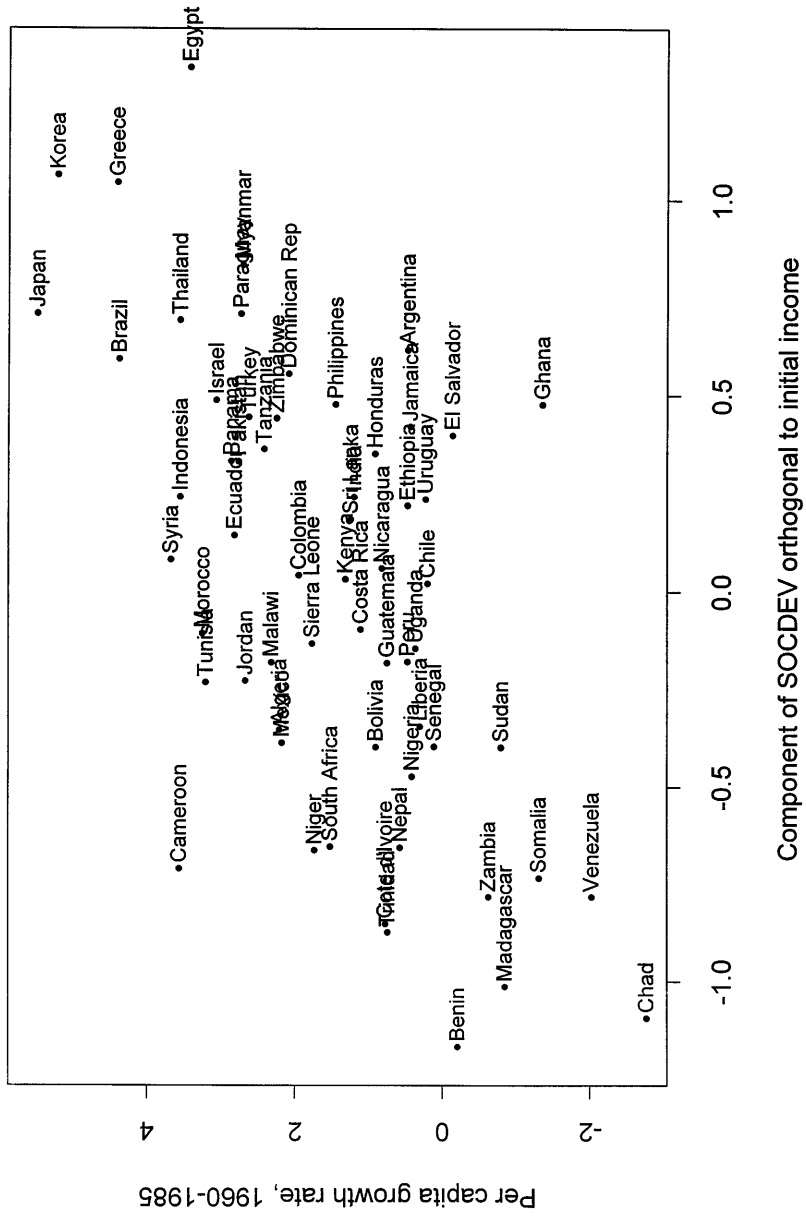

FIGURE II
Social Development and Growth

TABLE II
CROSS-COUNTRY REGRESSIONS USING SOCDEV

Dependent variable: log difference GDP per capita, 1960–1985					
Model	1	2	3	4	5
Constant	0.39	4.28	3.21	5.33	4.60
	(7.24)	(5.29)	(4.06)	(3.54)	(3.11)
SOCDEV	0.13	0.45	0.23	0.23	0.09
	(2.46)	(5.61)	(2.23)	(2.42)	(0.81)
ln (*I*/GDP)				0.35	0.35
				(3.12)	(3.21)
ln ($n + g + \delta$)				−0.09	0.09
				(0.19)	(0.21)
ln (SCHOOL)				0.18	0.07
				(2.05)	(0.73)
ln (GDP60)		−0.53	−0.36	−0.53	−0.39
		(4.82)	(3.28)	(5.27)	(3.79)
AFRICA			−0.38		−0.40
			(2.85)		(2.81)
LATINCA			−0.20		−0.12
			(1.49)		(0.91)
EASTASIA			0.32		0.26
			(1.27)		(1.11)
INDUST			0.33		0.29
			(1.55)		(1.39)
R^2	0.09	0.36	0.51	0.50	0.61
σ	0.41	0.35	0.32	0.32	0.29
N	60	60	60	60	60

t-statistics are in parentheses.

per capita income, 1960–1985. The results are reported in Table II. For the moment, concentrate on the simplest models, 1 and 2.

In model 1, SOCDEV is significantly positive, and explains 10 percent of the variation in growth rates (and more than 20 percent if the outliers Argentina, Cameroon, and Venezuela are removed). As one would expect, the results are rather stronger when initial income is also included in the growth equation to account for convergence effects, as in model 2. These two variables can explain nearly 40 percent of the growth rate variation, and SOCDEV is strongly significant.[6] This result is robust to the use of regional dummies, as in model 3.

There is good reason to believe that use of the index would

6. It is worth remembering that most growth regressions explain only around 50 percent of the variation in growth rates, and use data subsequent to 1960, such as average investment rates.

have helped improve growth forecasts. When just initial income is used to model the growth rate for these 60 countries, the R^2 is less than 0.01, and the standard error of the regression is 0.43 compared with 0.35 here. Hence anyone armed with AM [1967] might have done rather better at forecasting growth than their contemporaries.

It is also worth emphasising that the effect of SOCDEV is quantitatively strong. As measured by model 2 over 25 years, a one-standard-deviation increase in this variable would raise the annual growth rate by 1.8 percentage points. As an illustrative example, if India had achieved the same level of social development on this measure as South Korea by 1960, then its income per capita would have grown at just over 3 percent a year instead of 1.3 percent. India's per capita income in 1985 would then have been almost 60 percent higher.

In principle, we could envisage a number of reasons for the strength of the effect. It may be that countries with a relatively high level of the index are converging to a higher steady state level of income, perhaps because the index proxies for the overall level of efficiency. Other possibilities are that higher levels of socioeconomic development are associated with greater investment in physical and human capital, with more productive investments, or with a greater ability to assimilate technology from abroad. These explanations for the role of SOCDEV are not mutually exclusive.

There is some evidence that countries with higher levels of socioeconomic development invest more in physical capital and schooling. Using the MRW data on investment and schooling, the correlations with SOCDEV are 0.56 and 0.83, respectively. The component of the index orthogonal to income is also correlated with investment and schooling. This suggests that the AM index will be useful in explaining cross-country variation in factor accumulation.

We also examine the direct effect of social arrangements on growth, acting through total factor productivity (TFP). To study this, we work with a standard regression specification based on MRW:

$$(1)\quad \ln\frac{Y(t)}{L(t)} - \ln\frac{Y(0)}{L(0)} = \theta \ln A(0) + G(X) + \theta\frac{\alpha}{1-\alpha-\beta}\ln(s_k) + \theta\frac{\beta}{1-\alpha-\beta}\ln(s_h) - \theta\frac{\alpha+\beta}{1-\alpha-\beta}\ln(n+g+\delta) - \theta\ln\frac{Y(0)}{L(0)},$$

where $Y(t)/L(t)$ is per capita income at time t, s_k and s_h are the rates of physical and human capital accumulation, α and β are technology parameters, n is population growth, g is efficiency growth, and δ is the rate of depreciation. $A(t)$ is the level of efficiency at time t, and $G(X)$ is the rate of efficiency growth expressed as a function of the variables X. Note that in principle we should estimate the equation by nonlinear least squares, replacing g in the fifth term by the function $G(X)$. In practice, this does not work well, and most growth researchers work with a specification very similar to (1), making the standard assumption that g is 0.02.

Estimates of this equation are presented as regression models 4 and 5 in Table II. From model 4, it is clear that SOCDEV remains positive and significant even when controlling for investment rates. This suggests that the index has a direct effect, beyond that on factor accumulation, although it is no longer precisely measured given the inclusion of a full set of regional dummies. When we add dummy variables for sub-Saharan Africa, Latin America, East Asia, and the industrialized countries, SOCDEV is no longer significant at the .05 level. However, only one of the dummies is significant at conventional levels.

Overall, models 2 and 3 suggest that the index compiled by AM is a useful predictor of subsequent growth performance. It helps predict growth even when we use subsequent information, such as the averages of investment, schooling, and population growth that enter model 4. This direct effect is of particular interest, since it indicates that social arrangements might matter via technology transfer, just as Abramovitz [1986] proposed.

However, the direct effect is not so strong that it is robust to the inclusion of regional dummies. When controlling for investment, it seems that much of the explanatory power of the index comes from its variation between regions. In the next section we will investigate measures of social capability for which the direct effect is more robust.

IV. Criticisms of the Adelman-Morris Approach

In the working paper version of this research [Temple and Johnson 1996], we presented a range of evidence suggesting that SOCDEV is a robust determinant of economic growth, and that this effect operated partly via TFP growth. However, a common reaction was that the construction of the index by AM used a range of economic and social variables, and so may capture the

TABLE III
SOCIOECONOMIC COMPONENTS OF THE ADELMAN-MORRIS INDEX

	Factor loading
Size of the traditional agricultural sector	−0.89
Extent of dualism	0.84
Extent of urbanization	0.84
Character of basic social organization	0.83
Importance of indigenous middle class	0.82
Extent of social mobility	0.86
Extent of literacy	0.86
Extent of mass communications	0.88
Crude fertility rate	−0.63
Degree of modernization of outlook	0.75

Note that the signs in Table III are reversed from those in AM, to bring them into line with their final calculation of SOCDEV. A full list of the factors and their loadings can be found in the Appendix.

notion of social capability only imperfectly. A second criticism, closely related, was that this work failed to shed much light on why society might matter.

1. Measuring Social Capability

To address these criticisms, and measure social capability more accurately, first we need to return to the original construction of the index. The final version of SOCDEV was constructed using a factor analysis of per capita GNP and 22 social and political variables. SOCDEV was the first factor, and was interpreted as representing "the processes of changes in attitudes and institutions associated with the breakdown of traditional social organization" [AM 1967, p. 153]. The justification for this interpretation is that the first factor placed most weight on the socioeconomic indicators listed in Table III, which also shows the factor loadings.[7]

Of these indicators, several are distinctively "social." Among them is the "character of basic social organization," which we call KINSHIP. This categorizes countries by the dominance of the immediate family over the extended family or clan, and tribal allegiances. AM also classified countries by their "modernization of outlook." This variable, OUTLOOK, included an assessment of social and political participation, for instance through voluntary associations, and so might be thought of as a cross-country index

7. Remember that other indicators enter the calculation of the first factor scores, but are much less important. A full list, together with factor loadings, is presented in the Appendix.

of social capital. It also included a judgment of the support for political and economic modernization.

Other variables are more familiar to economists, and those such as the literacy rate and the fertility rate have rather less claim to represent the extent of social capability. One or two variables are borderline: AM attempted to measure the extent of social mobility using data on secondary school enrollment rates, in addition to information on access to middle class professions.

Hence, of the variables used to construct SOCDEV, some are conventionally "economic" and one or two of the "social" indicators were derived using data that are already familiar to growth researchers, such as school enrollments. Hence the explanatory power of the index may ultimately rest on its economic components, and it perhaps does not have much to say beyond variables already in common use.

We address these criticisms by concentrating on just five of the indicators that AM used to construct their index, the ones that seem most likely to capture differences in social arrangements. When combined with initial income, any of these five social indicators helps predict growth. One of the indicators, the extent of mass communications in the early 1960s, has a particularly strong correlation with subsequent growth, and seems to have a direct effect on TFP growth as well as on factor accumulation. In Section V we will show that this effect is robust to the inclusion of a wide range of variables used in other studies. In Section VI we consider the relation between this communications index and SOCDEV, and the indicators of trust and civic community used by Knack and Keefer [1997] and La Porta et al. [1997].

2. Decomposing the Index

Of the indicators listed in Table III, five seem best suited to capturing differences in social arrangements. Two of them we have already discussed: the character of basic social organization (KINSHIP) and the modernization of outlook (OUTLOOK). The remaining three are the extent of mass communications (COMMS), the extent of social mobility (MOBILITY), and the importance of the indigenous middle class (MIDCLASS).

Full descriptions of these variables can be found in AM [1967], but brief summaries may be useful. COMMS is an assessment of communications, based on newspaper circulation and the number of radios per head. MOBILITY is based on school enrollment data, an assessment of the importance of the middle class, and the presence or absence of cultural or ethnic barriers to

TABLE IV
REGRESSIONS USING FIRST PRINCIPAL COMPONENT

Dependent variable: log difference GDP per capita, 1960–1985					
Model	1	2	3	4	5
PCSOC5	0.11	0.38	0.19	0.16	0.06
	(1.99)	(4.35)	(1.87)	(1.68)	(0.61)
R^2	0.06	0.25	0.50	0.48	0.61
σ	0.42	0.38	0.32	0.33	0.29

Regression models are those used in Table II. The constant and other coefficients are omitted to save space. *t*-statistics are in parentheses.

social mobility. Finally, the variable MIDCLASS is intended to reflect the importance of the indigenous middle class, rising with the proportion of men employed in the professions, and falling with a greater role for expatriates in these professions.

Our initial approach was to derive an index of social capability based on subsets of these five indicators. We took as our first index, PCSOC5, the first principal component of all five variables. Since the variable MIDCLASS may partly reflect economic inequality or human capital, we omitted it from the construction of a second index, PCSOC4, the principal component of the remaining four variables. Since the social mobility indicator is based partly on school enrollment data, we omitted both MIDCLASS and MOBILITY from the construction of a third index, PCSOC3. In practice, the exact composition does not make much difference: the correlations between these three indices are all greater than 0.97. The correlation between PCSOC5 and SOCDEV is 0.94.

We estimated the regression models in Table II using these new indexes in place of SOCDEV. The results from all three indexes were qualitatively similar, as one would expect given the high correlations between them.[8] PCSOC5 gave marginally better results, and for brevity, we report in Table IV simply the coefficient on PCSOC5 for the five different models. The results are slightly weaker than those using SOCDEV. However, the variables constructed purely from social components remain helpful in explaining subsequent growth.

As before, the effect of the social variables is not robust to the inclusion of factor accumulation and a full set of regional dummies

8. Full results available on request. We also constructed an index by regressing SOCDEV on three social indicators (COMMS, KINSHIP, and OUTLOOK) and using the fitted values in growth regressions. Again, the findings were qualitatively similar.

TABLE V
GROWTH REGRESSIONS USING SOCIAL COMPONENTS

Dependent variable: log difference GDP per capita, 1960–1985					
Social var	COMMS	OUTLOOK	KINSHIP	MOBILITY	MIDCLASS
Constant	3.06	1.20	1.74	2.17	1.52
	(4.24)	(1.67)	(2.59)	(3.11)	(2.37)
Social var	1.35	0.35	0.59	0.80	0.87
	(4.72)	(1.45)	(2.93)	(3.49)	(2.79)
ln (GDP60)	−0.45	−0.13	−0.22	−0.29	−0.22
	(4.01)	(1.23)	(2.23)	(2.77)	(2.16)
R^2	0.28	0.04	0.13	0.18	0.12
σ	0.37	0.43	0.41	0.40	0.41
N	60	60	60	60	60
Social variables in full growth regression with regional dummies					
(Other variables omitted for brevity)					
Social var	0.85	−0.24	−0.12	0.04	0.13
	(2.84)	(0.69)	(0.60)	(0.19)	(0.52)
R^2	0.66	0.61	0.61	0.61	0.61
σ	0.27	0.29	0.29	0.29	0.29
N	60	60	60	60	60

t-statistics are in parentheses.

(although, again as before, only one regional dummy is significant). Next, we ask whether this is also true of the individual social components. In Table V we examine the growth effects of these variables in two ways. First, we consider their explanatory power when initial income is the only other control variable. This gives some indication of the overall effect of the social variable, whether it acts through TFP growth or via factor accumulation. Second, we enter each social variable into a full growth regression, including factor accumulation and regional dummies as in the last columns of Table II and IV. This allows us to investigate the direct effect on TFP growth.

All the social variables except OUTLOOK are significant at the .05 level when entered into a very simple growth regression. This supports our claim that growth forecasts made in the 1960s would have been improved by using proxies for social arrangements. The effect of mass communications is particularly strong; combined with initial income, these two variables explain about 30 percent of the variation in growth rates. If three influential outliers are omitted (Ghana, Japan, and Syria), then this figure rises to 40 percent.

It is also interesting to consider whether these variables remain significant when controlling for factor accumulation and regional dummies. As we pointed out earlier, existing studies based on indexes of social capital find that the effects are not robust to the inclusion of the investment ratio. The second half of Table V shows that this is also true for the AM variables, with the important exception of the mass communications index.

This variable, COMMS, is highly correlated with SOCDEV ($r = 0.88$), but its direct effect is more robust. It is significant even when controlling for investment, human capital accumulation, population growth, and four regional dummies. This indicates that there is an effect of social arrangements on TFP growth as well as that on factor accumulation. Over 25 years the measured impact of changes in communications is substantial. A one-standard-deviation change in COMMS is found to raise the TFP growth rate by one percentage point.[9]

V. Robustness Tests

Our results might be driven by omitted variables, or by influential outliers. In this section we turn to robustness testing. We take particular care to show that the relationship between social indicators and growth is robust to the inclusion of variables measuring human capital, urbanization, income inequality, and political stability. We consider the impact of 30 extra variables in all. Since we also include four regional dummies, this is a far more stringent test than those usually implemented in the literature.

The relationship we concentrate on is that between COMMS and TFP growth. As we have seen, the other social variables are likely to work best as an explanation of the international variation in factor accumulation, and measurement of their direct effect on TFP is not robust to the inclusion of the investment ratio and regional dummies. Other researchers report a similar finding [Knack and Keefer 1997], and hence it is the surprising robustness of COMMS that seems most worthy of further attention.

1. Controlling for Other Variables

We start by considering a range of variables representing educational achievement, health, urbanization, and income distri-

9. As a useful example, consider South Korea and the Philippines, two countries sometimes regarded as having similar initial conditions. In the early 1960s the communications index was one and a half standard deviations higher in South Korea.

TABLE VI
ROBUSTNESS TESTS FOR COMMS

Dependent variable: log difference GDP per capita, 1960–1985						
Regressor	Description	COMMS	New var	R^2	N	Source
Education variables						
BSHUM	Average years of schooling in 1965	0.62 (1.77)	0.08 (1.42)	0.70	51	Benhabib and Spiegel [1994]
HUMAN	Average years, over-25s, in 1960	0.61 (1.64)	0.02 (0.52)	0.64	50	Barro and Lee [1994]
SEC	Secondary school enrollment rate	0.92 (3.08)	−0.20 (0.40)	0.66	57	Barro and Lee [1994]
TEASEC	Pupil/teacher ratio	0.72 (1.94)	0.26 (0.42)	0.75	44	Barro and Lee [1994]
GEETOT	Ratio of education expenditure to GDP	0.93 (2.75)	−0.10 (0.02)	0.65	56	Barro and Lee [1994]
Health variables						
FERT	Fertility rate	0.90 (2.92)	0.04 (0.73)	0.67	59	Barro and Lee [1994]
MORT	Infant mortality rate (ages 0–1)	0.86 (2.73)	0.06 (0.05)	0.66	59	Barro and Lee [1994]
LIFEEXP	Life expectancy at birth	0.79 (2.43)	0.49 (0.59)	0.66	59	Barro and Lee [1994]
Urbanization and income distribution						
URBAGG	Proportion living in urban agglom-erations	0.84 (2.13)	0.86 (0.91)	0.66	45	Authors (see notes)
URBWB	Urbanization	0.95 (2.78)	−0.18 (0.44)	0.66	59	World Bank [1992]
MID	Income share of 3rd and 4th quintiles	1.00 (2.75)	0.74 (0.61)	0.74	39	Perotti [1996]

t-statistics are in parentheses. Comparable cross-country data on urbanization are difficult to obtain because definitions of "urban" differ across national censuses. To avoid this problem, we used data on cities from the U.N.'s *World Urbanization Prospects* [1995] to construct a more comparable measure, the proportion of the population living in urban agglomerations with over 750,000 people, as of 1960. We call this variable *URBAGG*. As a further robustness test, we experiment with an urbanization index for 1965 taken directly from the 1992 *World Development Report* [World Bank 1992]. This index is not strictly comparable across countries, but has wider coverage.

bution. All the variables we try are measured in 1960, or averaged over 1960–1964, unless stated otherwise. In Table VI we show the coefficient on COMMS when each variable is added to the full growth regression including regional dummies. To save space, only this coefficient and that on the new variable are reported.

One concern about COMMS is that it may simply act as a proxy for human capital. When we try a variety of human capital

variables, while retaining MRW's original index SCHOOL, then COMMS remains positively signed in each regression, and is significant at the .10 level for all variables except HUMAN. In the case of HUMAN, the index only just misses significance at the .10 level, while HUMAN itself is not significant.

We also tried splitting the indexes of educational achievement into one for males and one for females. This seems a useful exercise, given the observation of Stokey [1994] that differences between male and female schooling can act as a proxy for geographic regions or ethnic groups that educate women differently from men. Hence including these two variables may weaken the effect of our measure of social arrangements. Again, COMMS was almost significant at the .10 level, while the new educational indexes were negatively signed and insignificant even at the .30 level.

Given that the fertility rate is one of the social indicators used by AM, it is particularly important to test the effect of fertility. The effect of COMMS is robust to the inclusion of this variable and other indicators of health status. Nor is the result weakened by the inclusion of data on urbanization or income inequality.[10]

Table VII summarizes the robustness of COMMS to another selection of variables, including four indicators of trade policy and specialization, and indexes of political instability and ethnic diversity. Of this selection, only the measure of the fiscal surplus for the 1960s (SURP) provides any evidence of nonrobustness. However, it seems likely that one reason for this is the small sample. Data on the fiscal surplus for the 1960s are available only for a relatively small subset of the countries considered here (38). To explore this further, we tried including instead the fiscal surplus for the 1970s, data on which are available for 54 of the countries. In this case, the communications index is significant even at the .01 level.

We also tried several variables not reported here, the most noteworthy being ICRGE80, a survey measure of institutional quality used by Knack and Keefer [1995]. The direct effect of COMMS was robust to these as well.

We have demonstrated that only one variable, SURP, provides any firm evidence against the robustness of COMMS. A

10. As well as the Perotti measure reported in Table VI, we tried using data on Gini coefficients from the new income distribution data set designated "high quality" by Deininger and Squire [1996]. Unfortunately, this limited the sample to twenty countries. For what it is worth, COMMS was significant at the .10 level, while the Gini coefficient was not.

TABLE VII
FURTHER ROBUSTNESS TESTS FOR COMMS

Dependent variable: log difference GDP per capita, 1960–1985						
Regressor	Description	COMMS	New var	R^2	N	Source
Trade variables						
EX	Export share	0.72	−0.30	0.68	55	Barro and Lee
		(2.08)	(0.68)			[1994]
BMP	Black market premium	0.91	−0.30	0.70	57	Barro and Lee
		(3.12)	(2.07)			[1994]
OPEN6590	Years open, 1965–1990	0.86	0.06	0.66	54	Sachs and Warner
		(2.55)	(0.36)			[1995a]
SXP	Primary export share in GNP, 1970	0.85	−1.15	0.69	54	Sachs and Warner
		(2.68)	(2.17)			[1995b] (updated and revised)
Political instability and ethnic diversity						
SPI	Sociopolitical instability	1.10	−0.53	0.70	38	Perotti [1996]
		(2.51)	(0.13)			
ASSASS	Incidence of assassinations, 1960s	0.87	0.50	0.65	58	Easterly and
		(2.74)	(0.61)			Levine [1997]
WAR	Dummy for war on national territory, 1960s	0.84	0.02	0.66	60	Easterly and
		(2.80)	(0.20)			Levine [1997]
ETHNIC	Ethnic diversity	0.85	−0.22	0.66	60	Easterly and
		(2.81)	(0.01)			Levine [1997]
Miscellaneous variables						
SURP	Fiscal surplus, 1960s	0.16	−1.39	0.76	38	Easterly and
		(0.37)	(0.64)			Levine [1997]
GOVSH	Government consumption (ratio to GDP)	0.83	−0.63	0.66	59	Barro and Lee
		(2.69)	(0.92)			[1994]
RELMACH	Relative price of machinery	0.91	−0.01	0.69	43	Jones [1994]
		(2.56)	(0.06)			
LLY	Financial depth, 1960s	0.80	0.34	0.68	56	Easterly and
		(2.53)	(0.81)			Levine [1997]

t-statistics are in parentheses.

further question that might be asked is whether combinations of the variables also provide evidence against robustness. To investigate this, we carry out an extreme bounds analysis along the lines of Levine and Renelt [1992]. Our own analysis is considerably more stringent, in that we draw combinations of three variables from ten possibilities (BSHUM, FERT, LIFEEXP, URBAGG, MID, BMP, SXP, SPI, SURP, GOVSH) and also retain the four regional dummies.

We found that, in the 175 regressions carried out, COMMS was almost always positively signed. It is not too difficult to find combinations of variables such that COMMS is no longer significant at the .10 level, but these tend to be combinations that yield a small number of observations.[11] For instance, if we run a regression including BSHUM, URBAGG, and SPI, the *t*-ratio on the communications index is just 0.6, but this regression is restricted to just 25 observations.

Hence the conclusions to be drawn from the extreme bounds analysis are mixed. It should be noted that few variables are likely to survive such a stringent test (see, for example, Sala-i-Martin [1997]). In particular, in Tables VI and VII above, most of the variables emphasized in the literature were already insignificant when we included COMMS. This suggests that our results are more robust than many of those reported by previous researchers. It should also be remembered that in this section we are only studying the direct effect of COMMS on TFP growth. Earlier results indicate that social variables also matter for factor accumulation.

2. Outliers

A frequent concern with growth regressions is that the results may be driven by a few outlying observations. We check this by reestimating every regression reported in this paper using a robust estimator, least trimmed squares. A small group of observations with high residuals in the least trimmed squares estimates is then dropped from an otherwise straightforward OLS regression. This technique, known as reweighted least squares or RWLS, is recommended by Rousseeuw and Leroy [1987] and has previously been applied by Temple and Voth [1998] and Temple [1998].

In one or two cases, the omission of outliers did weaken the results slightly. In the case of SXP, the share of primary exports in GNP, the *t*-ratio on the communications index fell to 1.95, which still indicates significance at the .10 level. In the case of ETHNIC, ethnic diversity, the *t*-ratio fell to 1.72. In the case of ICRGE80, the adequacy of institutions, the *t*-ratio fell to 1.61, and so the communications index just missed significance at the .10 level. For the most part, however, we found that our results were considerably strengthened by the omission of a few outliers. For

11. We also repeated the 175 regressions but excluding six influential outliers (Argentina, Chad, Chile, India, Somalia, and Zambia). The results were qualitatively similar.

instance, on omitting outliers, COMMS was always significant at the .05 level when we tried adding the various human capital variables listed in Table VI.

VI. Interpretation of Our Measures

We have presented evidence that a variety of social variables affect growth, at least through factor accumulation. One measure in particular, COMMS, is also strongly correlated with TFP growth. Section V showed that this effect is robust to the inclusion of many different variables. In this section we examine the relation between the AM variables and other indicators of social arrangements that have been emphasized in the literature.

Several recent papers have presented evidence that economic performance is related to "social capital," where this refers to the extent of trust and membership in associations. Both La Porta et al. [1997] and Knack and Keefer [1997] use data from the World Values Survey to establish a link between trust and economic growth. Their studies can be seen as complementing ours, in that the trust data mainly originate from OECD countries from the 1980s onward, whereas our own work focuses on a larger sample of developing countries, and uses a variable constructed in the early 1960s. Another difference is our emphasis on social effects beyond those of trust.

Although the correlations of trust measures with our indexes of social development are of great interest, the overlap between the respective samples is small. Using data from Knack and Keefer [1997], only ten countries fall into both samples. The correlation of their TRUST measure with SOCDEV is just 0.076, while that of CIVIC is −0.086.[12] It also turns out that SOCDEV is negatively correlated with Knack and Keefer's measures of confidence in the government and the density of associational activity. Similar results apply when we replace SOCDEV with our own measure based on purely social components, PCSOC5, and with the single AM measure most closely related to social capital, OUTLOOK.

Progress is possible, however, if we follow Knack and Keefer [1997] and distinguish between associations that are likely to act as distributional coalitions (O-GROUPS, after Olson) and those

12. We have experimented with other measures of trust, including different treatments of the "don't knows" in the responses to the World Values Survey. We have also explored using trust data from a different survey period (1990–1991). Neither change alters our basic results.

that involve social interactions that can build trust and cooperative habits (P-GROUPS, after Putnam). As one might conjecture, SOCDEV has a negative correlation with O-GROUPS (−0.74) and a positive correlation with P-GROUPS (0.73). Although the sample sizes are very small, and outliers may be important, these results are suggestive.

One way of enlarging the sample is to consider the correlations between the Knack-Keefer measures and the original data on communications used by AM. Their calculation of COMMS is based on data in Russett et al. [1964] covering daily newspaper circulation and the number of radios per capita.[13] Of these two variables the log of daily newspaper circulation has a particularly strong correlation with growth. (It has a correlation with SOCDEV of 0.69.) When it is entered into growth regressions, the pattern of significance is similar to that of COMMS, although the results tend to be slightly weaker.

Since the newspaper and radio data are available for developed countries, as well as those analyzed by AM, we can compare these data with the TRUST measures for a larger sample, 25–29 countries. TRUST is positively correlated with both daily newspaper circulation (0.73) and the number of radios per capita (0.53). O-GROUPS is not correlated with newspaper circulation (0.12) but P-GROUPS is (0.73). Both group measures are correlated with the number of radios per capita, with correlations around 0.50.

These correlations are very interesting, because they suggest that one reason the mass communications index works so well is because it proxies for the strength of civic communities, as reflected in the TRUST and P-GROUPS measures.[14] Hence, there is some indication that COMMS is robustly correlated with growth because it captures the social capital of developing countries.

However, we also wish to return to one of the themes of the Introduction, that society matters in dimensions other than those emphasized in the social capital literature, at least for factor accumulation. Many of our results indicate a link between growth and the SOCDEV variable constructed by AM. This variable is only weakly correlated with the TRUST indicator used by Knack

13. We checked the data in Russett et al. [1964] against an updated source, Taylor and Jodice [1983]. Although there are some minor discrepancies in the series, the correlations between the two sources are above 0.997 for both newspaper circulation and radios in use.

14. It is worth noting that Helliwell and Putnam [1995] measured "civic community" partly using data on newspaper readership. Their index helped explain differing growth rates in Italian regions over 1950–1990.

and Keefer [1997], and this suggests that it captures things other than social capital, possibly a broader assessment of the extent of social development.

VII. Conclusions

The key finding of this paper is that, when combined with initial income, some basic indexes of social development in the early 1960s are very useful in predicting subsequent growth. This is true of the AM index published in 1967. It is also true of other related indexes: the first principal component of various social indicators, the extent of mass communications, and newspaper circulation in 1960. If observers in the early 1960s had given more emphasis to these indexes of social capability, they might have been rather more successful in predicting the fast growth of East Asia, and the underperformance of sub-Saharan Africa.

The indexes also have some predictive power when they are combined with data on subsequent investment, schooling, and population growth. This suggests that society is important beyond its role in determining the fertility rate and the extent of investments in physical and human capital. It may be that society matters because it influences the quality of investment, the level of overall technical efficiency, or the ability of countries to assimilate technology from abroad.

When we control for physical investment, schooling, and regional dummies, the effect of the AM index is weaker. At first sight, this suggests that social arrangements do not act directly through the technology channel. However, one component of the AM index, the index of mass communications, is robust even in these regressions. In Section V we were able to show that this direct effect is robust to the inclusion of standard proxies for human capital, urbanization, income distribution, and political instability.

This work suggests that the indicators compiled by AM do succeed in capturing some aspect of "social capability" rather than substituting for other, more conventional variables. Our results then raise some difficult questions about causal mechanisms. In Section VI we presented some tentative evidence that the AM index captures more than simply the extent of trust. This reinforces our emphasis on social capability. There are many possible reasons why society might matter, and their investigation should be a worthwhile direction for future research.

That said, our work also complements recent research into

the economic consequences of social capital. In particular, the extent of mass communications seems to be a good proxy for the strength of civic communities, as reflected in trust and membership in associations. Unusual for a social measure, the growth effect is robust to the inclusion of factor accumulation and other variables. One conclusion we draw is that an assessment of mass communications, given the absence of other good measures, is probably the best way of capturing variation in social capital across developing countries.

APPENDIX: ROTATED FACTOR MATRIX FROM ADELMAN AND MORRIS [1967]

Indicators	Rotated factor loadings				
	F_1	F_2	F_3	F_4	R^2
Per capita GNP, 1961	−.73	.31	−.26	−.03	.699
Size of agriculture	.89	−.21	.17	−.08	.869
Extent of dualism	−.84	.14	−.30	.04	.824
Extent of urbanization	−.84	.13	−.12	.02	.741
Character of social organization	−.83	.24	.10	.03	.761
Importance of middle class	−.82	.14	−.23	−.08	.755
Extent of social mobility	−.86	.21	−.18	−.18	.848
Extent of literacy	−.86	.32	.03	−.11	.845
Extent of mass communication	−.88	.28	−.06	−.02	.858
Degree of ethnic homogeneity	−.66	−.30	.34	−.21	.680
Degree of national unity	−.87	−.07	.01	−.18	.792
Crude fertility rate	.63	−.14	.05	.18	.448
Modernization of outlook	−.75	.31	−.39	−.03	.805
Strength of democratic institutions	−.48	.72	−.26	−.19	.857
Degree of opposition and press freedom	−.33	.82	−.02	−.10	.802
Competitiveness of political parties	−.32	.79	.08	.25	.801
Basis of political party system	−.43	.70	.04	.01	.681
Strength of labor movement	−.38	.63	−.36	−.05	.678
Political strength of the military	−.26	−.58	.36	.41	.706
Centralization of political power	−.07	−.65	.08	−.02	.432
Strength of traditional elite	.08	−.07	.73	.05	.543
Leadership commitment to development	−.14	−.02	−.80	−.21	.699
Degree of administrative efficiency	−.39	.37	−.59	−.16	.663
Degree of social tension	.22	.02	.02	.87	.816
Extent of political stability	−.07	.05	−.39	−.82	.821

This appendix reproduces Table IV-1 from AM [1967, p. 151].

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